

Notice of Allowability

Application No.

10/719,852

Examiner

Henry S. Hu

Applicant(s)

RAMOTOWSKI ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE of March 6, 2006.
2. ☒ The allowed claim(s) is/are 1,8,9 and 14-18.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. Authorization for this examiner's amendment was given in a telephone interview with **Michael P. Stanley** (Registration No. 47,108) (tel. 401 832-6393) on April 16, 2006 to amend parent Claim 1 as following:

CLAIMS

Claim 1 at line 9 please delete the phrase of "selected from the group"

DETAILED ACTION

2. This Office Action is in response to **RCE** request along with its **Amendment** filed on February 6, 2006. **Claims 1 and 8-9 were amended; while Claims 2, 5-7 and 12-13 were cancelled**, Claims 3-4 and 10-11 were previously cancelled, **and new claims 14-18** (with new independent Claim 14) **were added**. In order to further support such an amendment, a **Declaration** (six pages) written by Inventor **Thomas Ramotowski** was filed on March 6, 2006.

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To be more specific, **parent Claims 1 and 8 were both amended to include at least some limitations from originally submitted Claims 2-3 or 10-11** as Applicants have alleged. This is certainly a narrow down from previously claimed; it is also in a clearer format in response to 112-2nd rejection raised by Examiner. The Applicants allege that support for claim amendment can be found on page 7 of Remarks. With above examiner's amendment, a typographical error on "selected from the group" on parent Claim 1 is corrected. As discussed earlier, the examiner **accepts Applicants' drawing in three sheets with Figures 1-6** filed on November 21, 2003 with this application. **Claims 1, 8-9 and 14-18 are now pending** with a total of **three** independent claims (Claim 1, Claim 8 and Claim 14). An action follows.

3. Claim rejections under Final Office Action filed on December 2, 2005 are now removed for the reasons given in paragraphs 4-11 thereafter.

Allowable Subject Matter

4. Claims 1, 8-9 and 14-18 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above Claims 1, 8-9 and 14-18 are allowed over the closest references:

6. *The limitation of parent Claim 1 in present invention relates to an electrostrictive terpolymer consisting of: (A) vinylidene fluoride (65-71 mol%); (B) trifluoroethylene (26-33*

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mol%); and (C) a third monomer, wherein said third monomer is a partially halogenated, ethylene-based monomer containing at least one non-fluorine halogen atom, and selected from the group consisting of 1-chloro-2-fluoroethylene and 1-chloro-1-fluoroethylene (1-6 mol%) and is a monomer that favors gauche-type conformations along the backbone of the polymer chain of said terpolymer.

*Parent **Claim 8** relates to a method of making film by using terpolymer of Claim 1. Newly submitted parent **Claim 14** relates to a similar terpolymer of original Claim 1 but is rewritten in a clearer format. See other limitations of dependent **Claims 9 and 15-18.***

7. Applicant has claimed now in each of three parent claims including **Claims 1 and 14 (product) as well as Claim 8 (process of using)** an unexpected way of obtaining **an electrostrictive terpolymer** consisting of **three** monomers as: (A) **vinylidene fluoride** (65-71 mol%); (B) **trifluoroethylene** (26-33 mol%); and (C) **a third monomer** (1-6 mol%). The key point is that the third monomer is very much specified as: a partially halogenated, ethylene-based monomer containing at least one non-fluorine halogen atom with a condition that its existence is able to favor gauche-type conformations along the backbone of the polymer chain of said terpolymer. For instance, such a **third monomer can be 1-chloro-2-fluoroethylene, 1-chloro-1-fluoroethylene or its mixture** since Markush language “selected from the group consisting of” is used.

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For the record purpose, such an amendment is mainly resulted by following the second interview summary conducted on January 26, 2006. In order to further support such an amendment, a **Declaration** (six pages) **written by Inventor Thomas Ramotowski** filed on March 6, 2006 was also received.

As discussed earlier in the above-mentioned 112-2nd rejection, the term of **“at least one monomer” in parent Claims 1 and 8 can be indefinite or vague according to MPEP since it can be any one of three choices** including: (A) monomer selected from the group consisting of 1-chloro-2-fluoroethylene and 1-chloro-1-fluoroethylene, (B) monomer has **at least one halogen atom** side group, wherein said halogen atom side group is chlorine, **and** (C) monomer favors gauche-type linkage along a backbone of a polymer chain of said terpolymer. An indefinite issue is thereby existed since component C or B is not necessarily to be component A, while component C is also not necessarily to be component (B).

In a very close examination on all three pending independent claims, the language of “at least one monomer” has now been changed to **“a third monomer”** being described in a much clear format as disclosed above. All independent claims are at least including some limitations from originally submitted Claims 2-3 or 10-11 (see Applicants’ allegation on page 12 bottom of Remarks). All rejections cannot thereby stand as follows:

Regarding **one 102 rejection**, **Honn et al.** may have disclosed the preparation of various fluorinated elastomeric copolymers comprising repeating units of **vinylidene fluoride (VDF)**,

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trifluoroethylene (TrFE) and 1-chloro-1-fluoro-ethylene (CFE) as long as at least one of the mono-olefinic compounds must contain at least one carbon atom linked only to hydrogen and carbon atoms. However, only the type of **dipolymer** is exemplified on column 2 at lines 50-66, the terpolymer of (VDF-TrFE-CFE). If existed it would be only one among many copolymers therefrom. Additionally, Honn cannot appreciate the existence of same or similar **gauche-type** conformations along backbone of polymer chain being critical to obtain the unique electrostrictive property.

Regarding the **other one 102 rejection**, Nakamura et al. only disclose the preparation of a fluorinated **piezoelectric** copolymers comprising repeating units of **vinylidene fluoride (VDF) (40-87 mol%), trifluoroethylene (TrFE) (10-40 mol%) and vinyl fluoride (3-20 mol%)**. However, the chemical structure of **vinyl fluoride** is not fully reading on “a third monomer” of current independent claims, which requires “**at least one “non-fluorine” halogen atom** such as chlorine”. It is noted that **even a tiny atom different, the monomer becomes very different**.

Regarding the **103 rejection** by Nakamura/Honn for Claims 4-5, 7, 10-11 and 13, Nakamura is “at least” silent about including the monomer of chlorofluoroethylene with additional chlorine atom as compared with vinyl fluoride to be with monomers of VDF and TrFE in the terpolymer. As discussed above, secondary reference Honn cannot fix the deficiency of Nakamura.

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Additionally, the present invention has already shown **unexpected results** in examples along with some comparative examples for making such an electrostrictive terpolymer (see six figures as well as the Declaration written by Inventor Thomas Ramotowski). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation: **US Patent No. 6,787,238 to Zhang et al.** (with the same Assignee but with only a US filing date of 3-27-2002 and a publication date of 9-7-2004) has disclosed a process for making various terpolymers from a mixture of three different monomers comprising: (A) VDF, (B) TrFE or TFE, and (C) at least one third monomer as many specified halogenated monomers (column 5, line 33-52). The third monomer may include many types of halogenated monomers including chlorofluoroethylene. **Only after stretching and then annealing** it will show property on electrostrictive strain. However, the use of chlorofluoroethylene is without numbering on halogen atoms. The specific terpolymer of (VDF-TrFE-CFE) if existed would be only one among many copolymers therefrom. Additionally, the **key issue** of “**gauche-type conformations** along the backbone of polymer chain” is also not disclosed. Therefore, Zhang fails to teach or fairly suggest the terpolymers of present invention.

US Patent No. 4,863,648 to Scheinbeim et al. only discloses a process for making polarized material by forming a solution of a material capable of being polarized with a

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polarization solvent which can be removed by evaporation, wherein said material can be copolymers of **vinylidene fluoiride** with vinyl fluoride, **TrFE**, TFE, **vinyl chloride** and the like (column 4, line 55-61; abstract, line 1-4). The chemical structure of **vinyl chloride** is not fully reading on “a third monomer” of current independent claims, which requires some fluorine atom(s) and “**at least one “non-fluorine” halogen atom** such as chlorine”. The specific terpolymer of (VDF-TrFE-CFE) if existed would be only one among many copolymers therefrom. Additionally, the issue of “**gauche-type conformations** along the backbone of polymer chain” is also not disclosed. Therefore, Scheinbeim fails to teach or fairly suggest the terpolymers of present invention.

11. On making **an electrostrictive terpolymer** consisting of three specific monomers as: (A) **vinylidene fluoride** (65-71 mol%); (B) **trifluoroethylene** (26-33 mol%); and (C) **a third monomer** (1-6 mol%). The key issue is that (A) “the third monomer is a partially halogenated, ethylene-based monomer containing at least one non-fluorine halogen atom with a condition that its existence is able to favor gauche-type conformations along the backbone of the polymer chain of said terpolymer, or (B) such a third monomer can be specifically as 1-chloro-2-fluoroethylene, 1-chloro-1-fluoroethylene or its mixture, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary

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skill in the art. Therefore, the two independent and parent **Claims 1 and 14 (product) and 8** (process of using) are allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 9 and 15-18** are passed to issue.

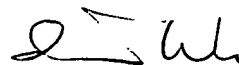
13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Patent Examiner, art unit 1713, USPTO

April 16, 2006



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